

Supplementary Information

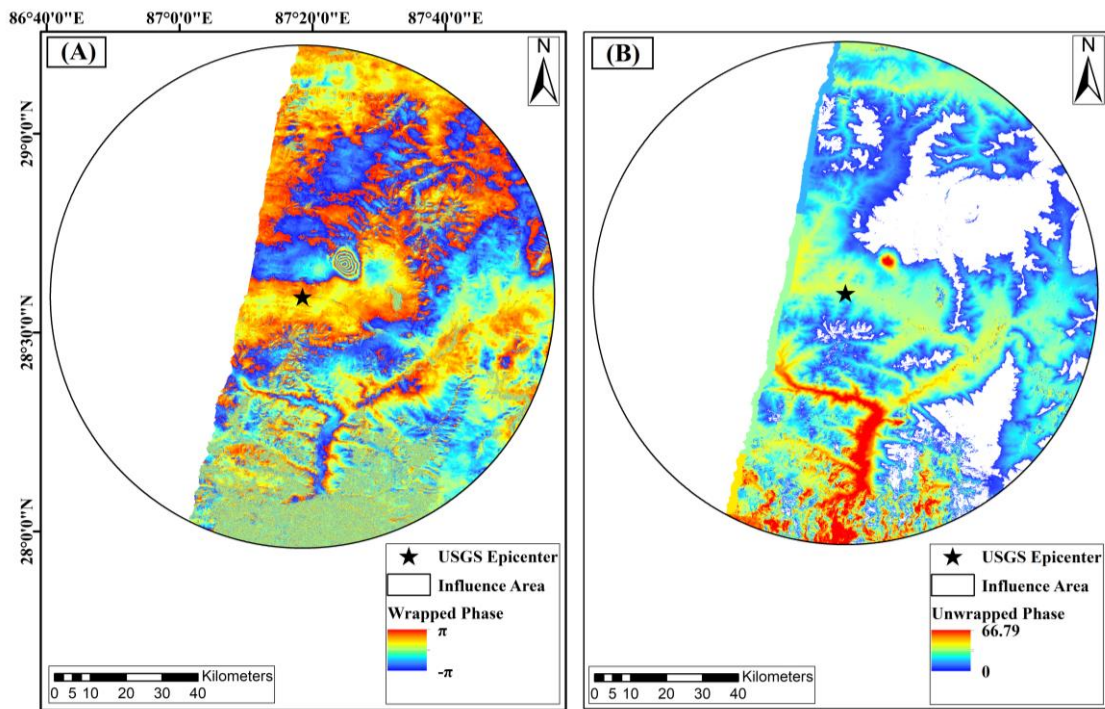


Figure S1: Map showing (A) wrapped phase and (B) unwrapped phase within the influence area for 2020 Tibet earthquake (Mw 5.7).

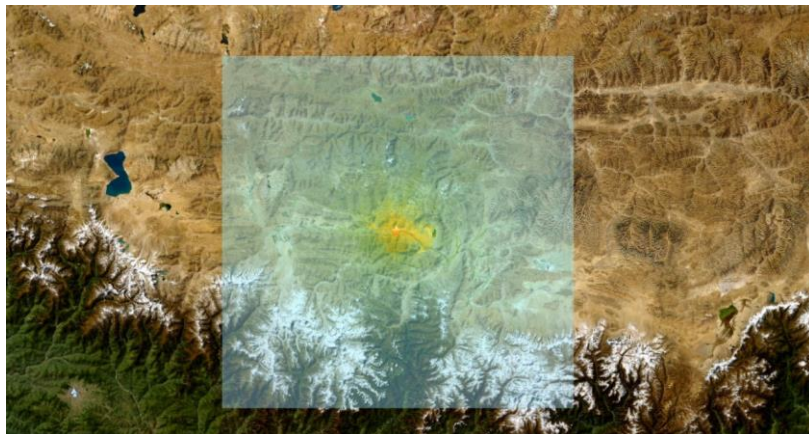
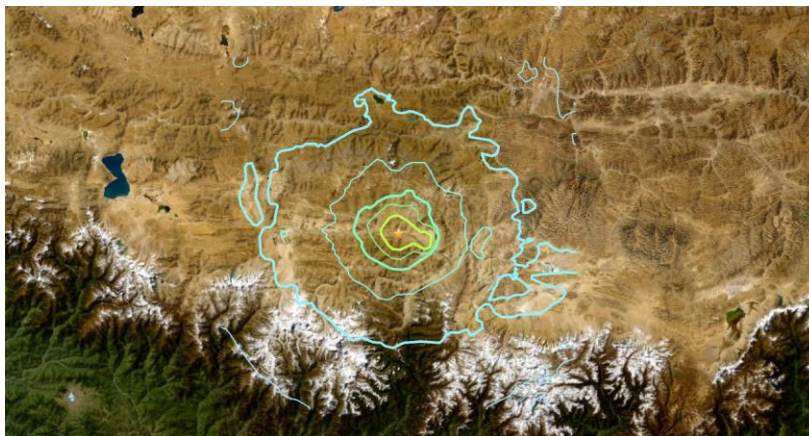


Figure S2: USGS Shake Map for 2020 Tibet earthquake (Mw 5.7).



Supplementary Information

SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
DAMAGE	None	None	None	Very light	Light	Moderate	Moderate/heavy	Heavy	Very heavy
PGA(%g)	<0.0464	0.297	2.76	6.2	11.5	21.5	40.1	74.7	>139
PGV(cm/s)	<0.0215	0.135	1.41	4.65	9.64	20	41.4	85.8	>178
INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

Scale based on Worden et al. (2012) Version 1: Processed 2022-01-25T17:06:17Z
 △ Seismic Instrument ○ Reported Intensity ★ Epicenter

Figure S3: USGS Isoseismal contours and the MMI chart for 2020 Tibet earthquake (Mw 5.7).

Table S1: Different focal mechanism solutions for the earthquake events considered in the study

Earthquake (Event ID)	Latitude (°)	Longitude (°)	Depth (km)	Nodal Plane-I			Nodal Plane-II			M _w	Source
				Strike-1	Dip-1	Rake-1	Strike-2	Dip-2	Rake-3		
Tibet EQ (617805561)	28.601	87.321	7	162	48	97	353	42	82	5.6	IPGP
	28.648	87.331	13	185.08	40.47	66.51	335.34	53.47	108.78	5.7	GFZ
	28.4065	87.2159	13.5	179.75	41.86	77.23	342.83	49.4	101.2	5.7	NEIC
	28.51	87.42	12	184	47	77	345	45	103	5.7	GCMT
Leh EQ (619321061)	34.208	78.205	10	27.62	40.6	94.12	213.04	49.53	86.48	5.1	GFZ
	35.415	77.5847	80.5	87.05	45.63	100.39	252.36	45.32	79.55	5.2	NEIC
Thang EQ (611835462)	35.74	77.45	118.1	118	65	74	332	30	120	5.2	GCMT

Note: **IPGP**- Institut de Physique du Globe de Paris; **GFZ**- German Research Centre for Geosciences; **NEIC**-National Earthquake Information Center; **GCMT**- Global Centroid-Moment-Tensor Project

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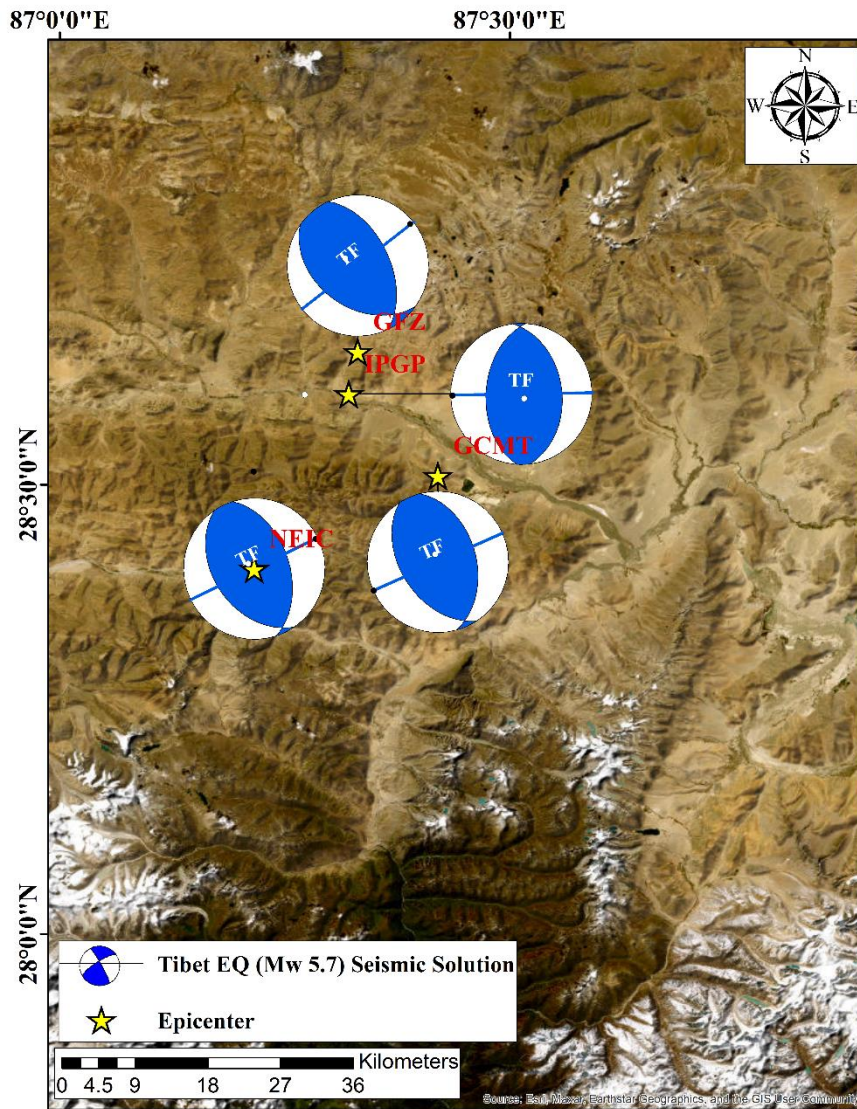


Figure S4: Beach ball representation for the focal mechanism solutions of the 2020 Tibet Earthquake (M_w 5.7).

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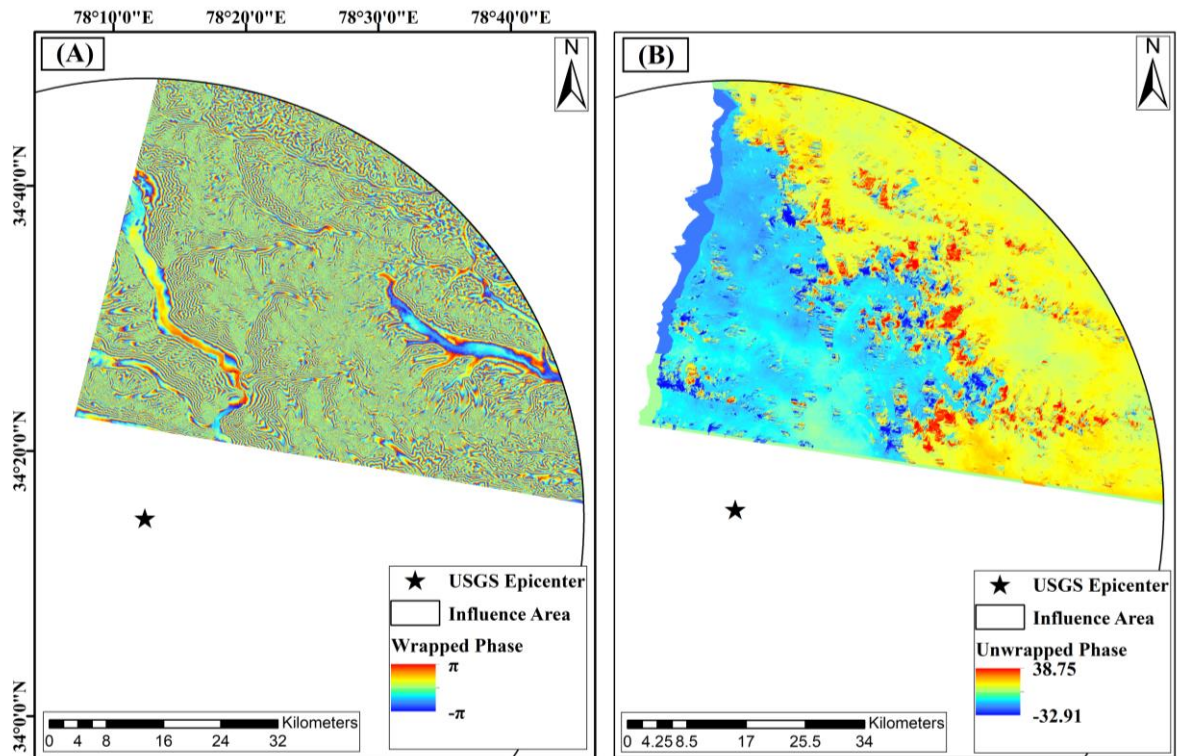


Figure S5: Map showing (A) wrapped phase and (B) unwrapped phase within the influence area for 2020 Leh earthquake (Mw 5.3).

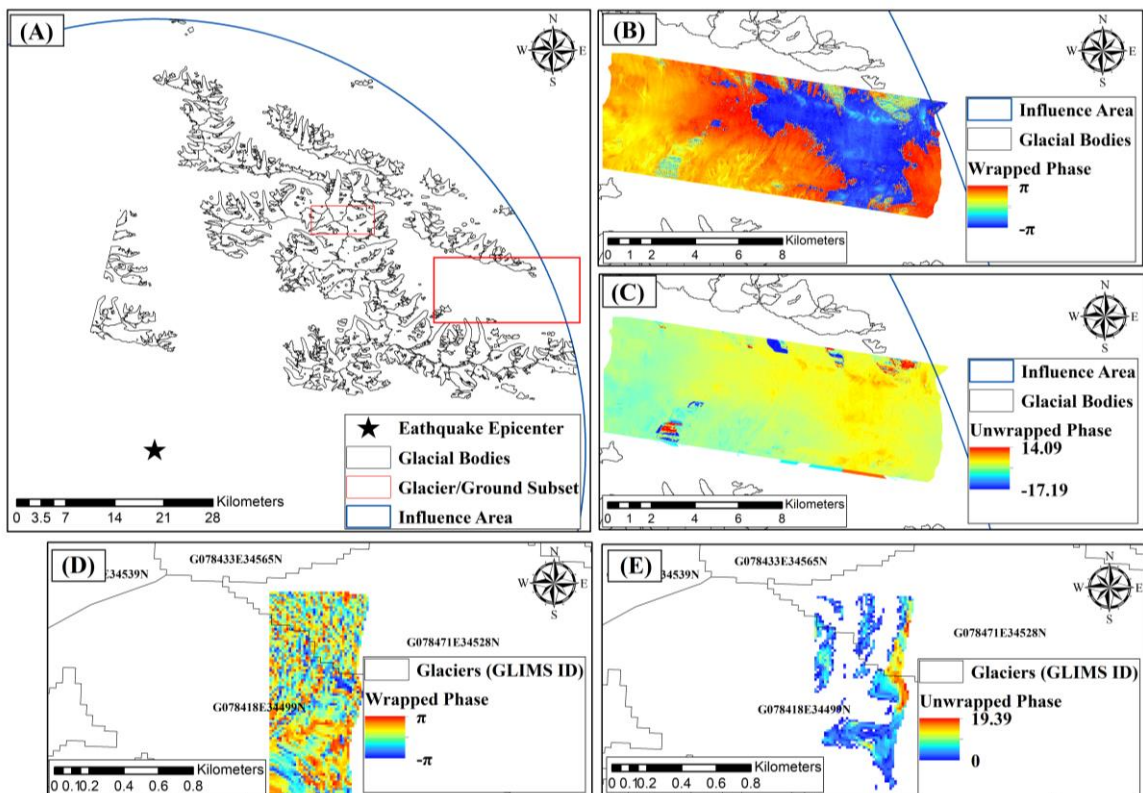


Figure S6: Map showing (A) glacial and ground subset regions, (B) wrapped phase within ground subset, (C) unwrapped phase within ground subset, (D) wrapped phase within glacial subset and (E) unwrapped phase within glacial subset for 2020 Leh earthquake (Mw 5.3).

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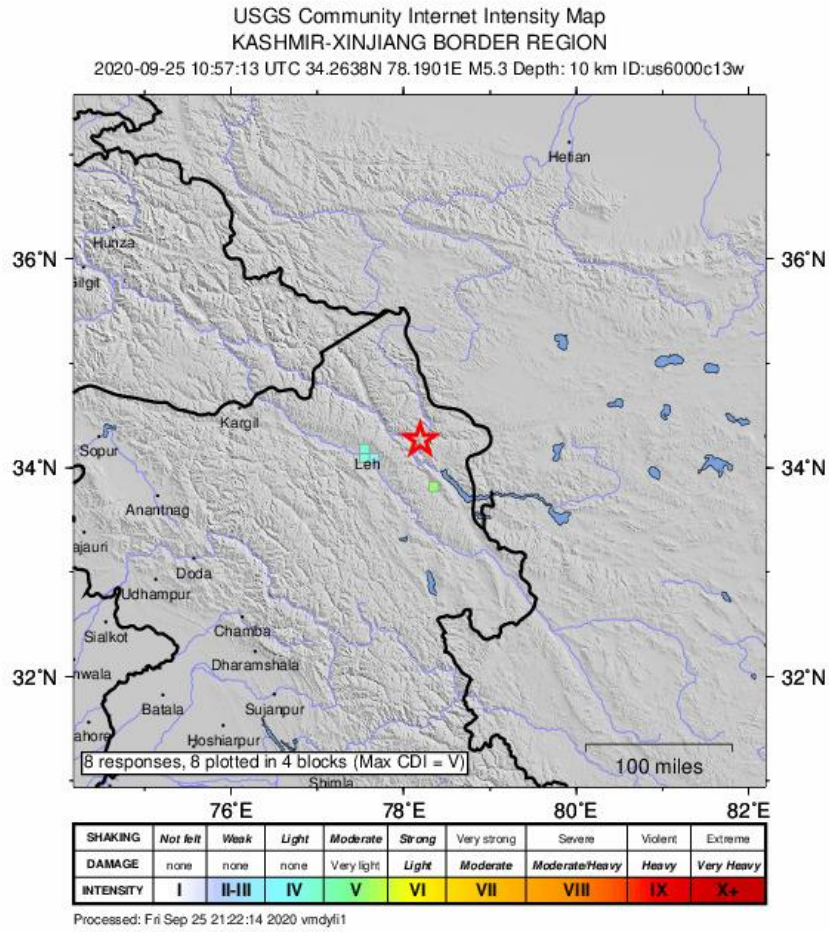


Figure S7: USGS Shake Map for 2020 Leh earthquake (Mw 5.3).

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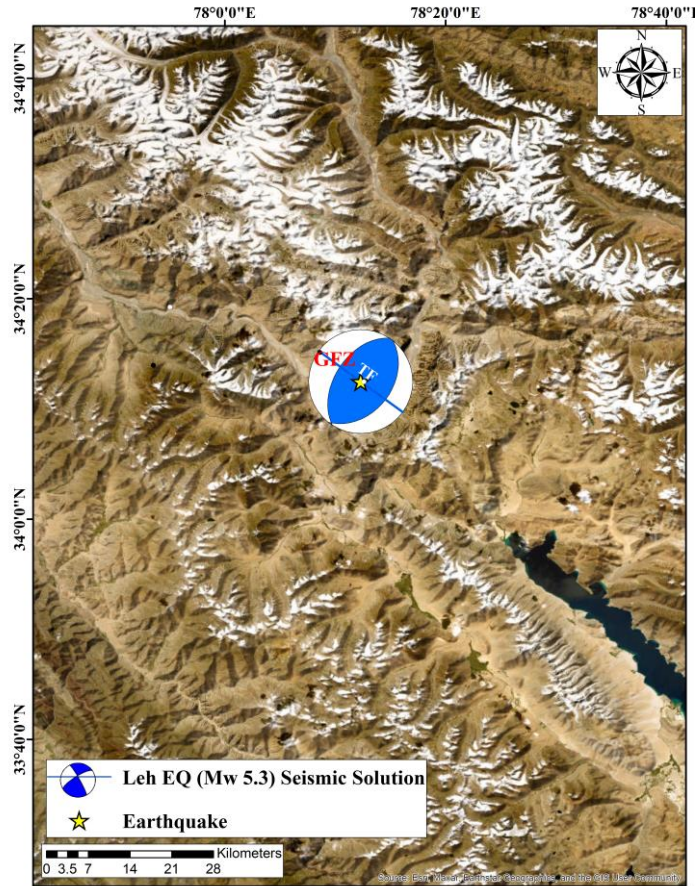


Figure S8: Beach ball representation for the focal mechanism solutions of the 2020 Leh Earthquake (M_w 5.3).

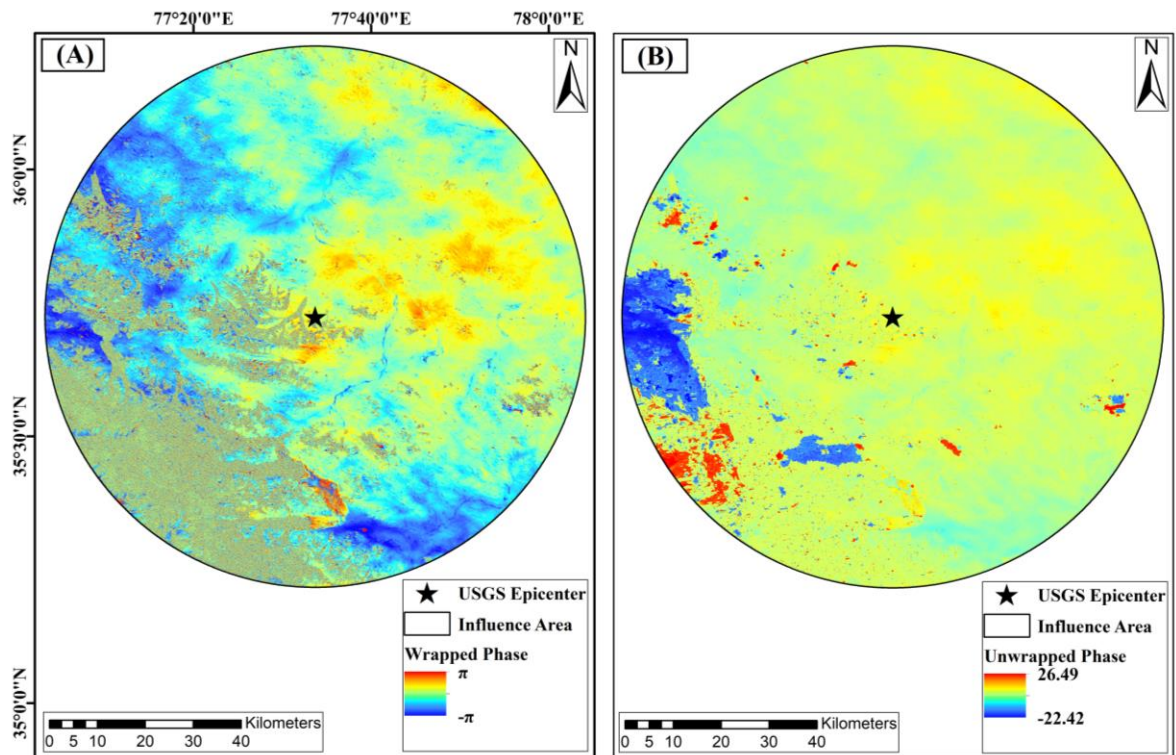


Figure S9: Map showing (A) wrapped phase and (B) unwrapped phase within the influence area for 2017 Thang earthquake (M_w 5.2).

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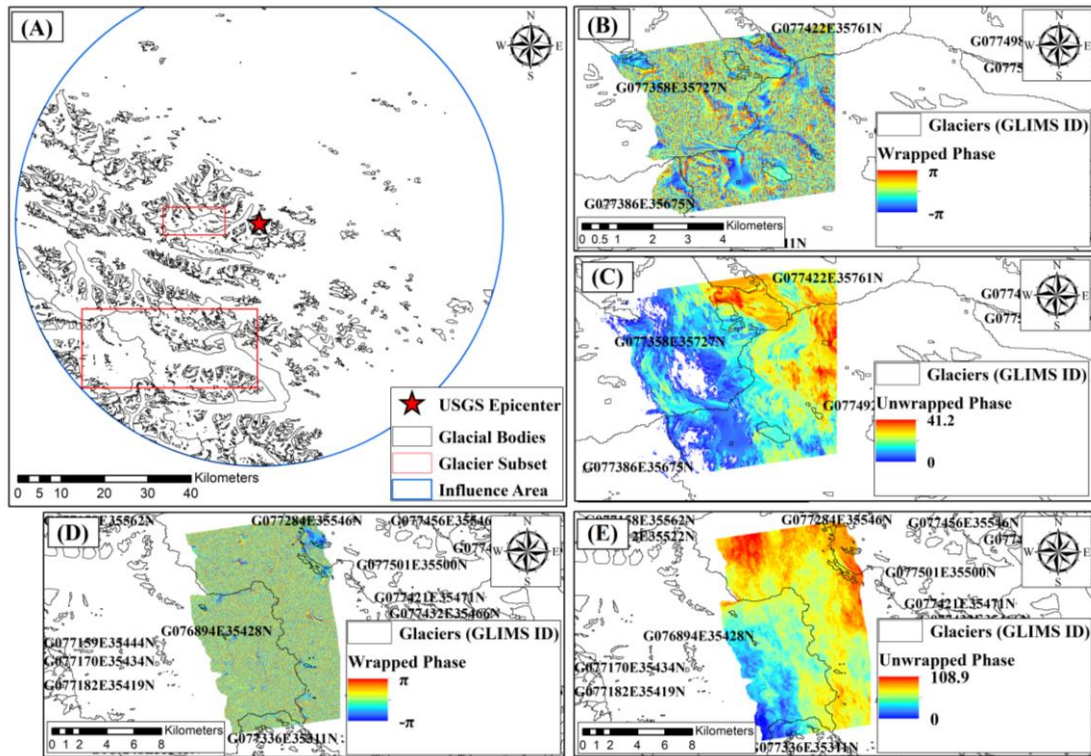


Figure S10: Map showing (A) glacial subset regions, (B) wrapped phase within glacial subset-1, (C) unwrapped phase within glacial subset-1, (D) wrapped phase within glacial subset-2 and (E) unwrapped phase within glacial subset-2 for 2017 Thang earthquake (Mw 5.2).

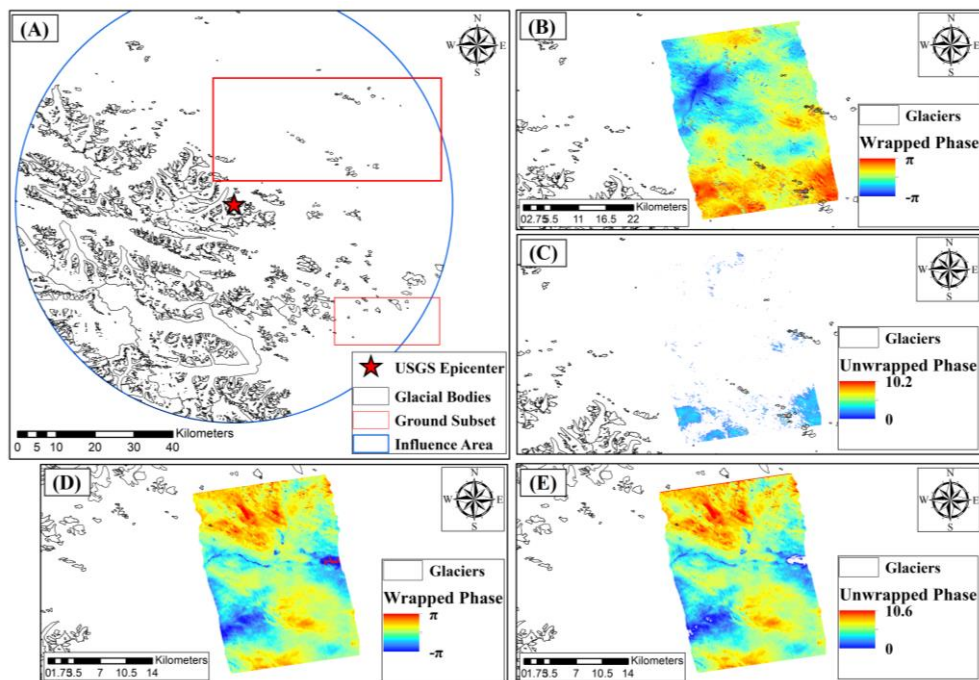


Figure S11: Map showing (A) ground subset regions, (B) wrapped phase within ground subset-1, (C) unwrapped phase within ground subset-1, (D) wrapped phase within ground subset-2 and (E) unwrapped phase within ground subset-2 for 2017 Thang earthquake (Mw 5.2).

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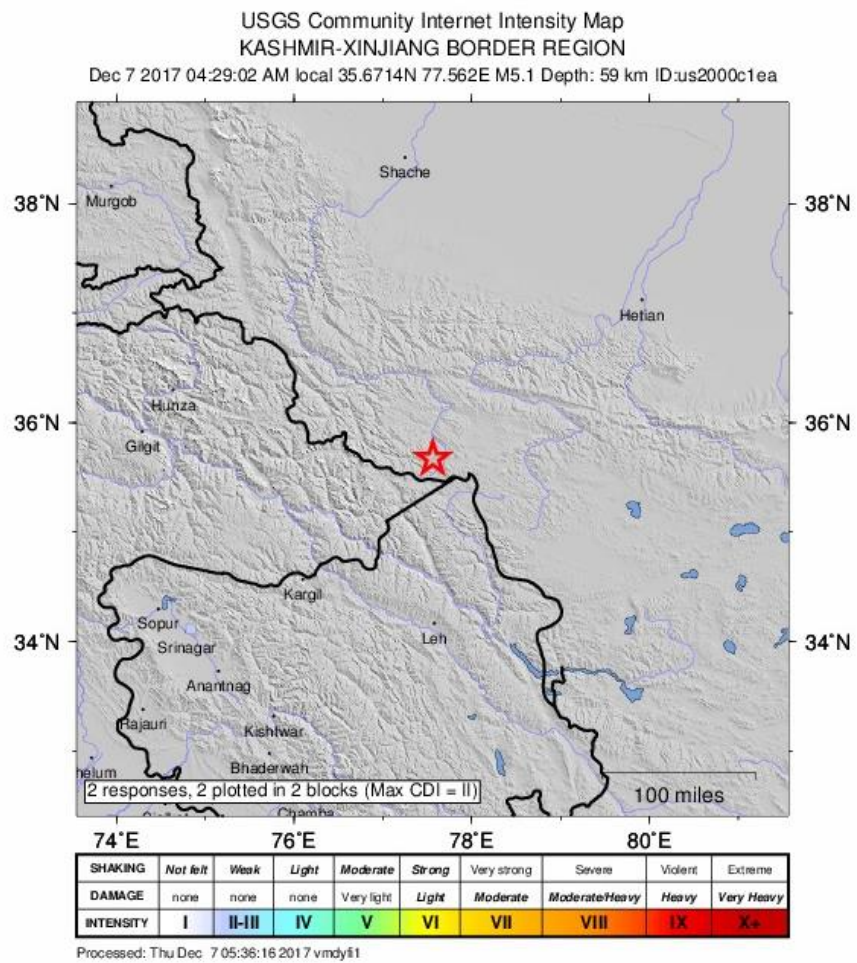


Figure S12: USGS Shake Map for 2017 Thang earthquake (Mw 5.2).

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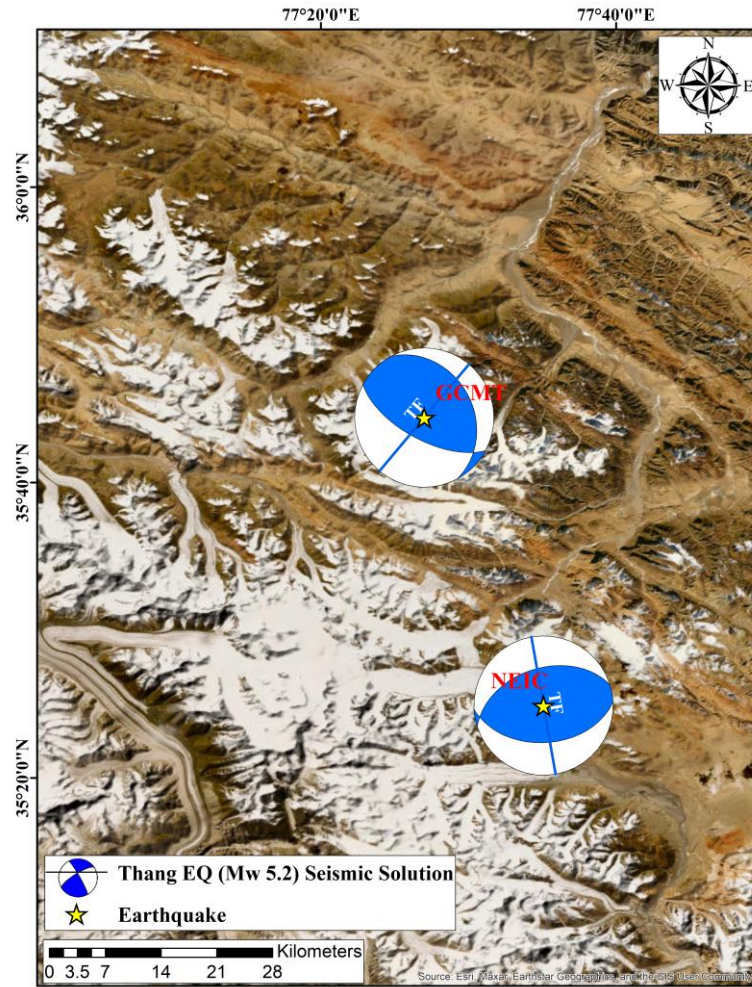
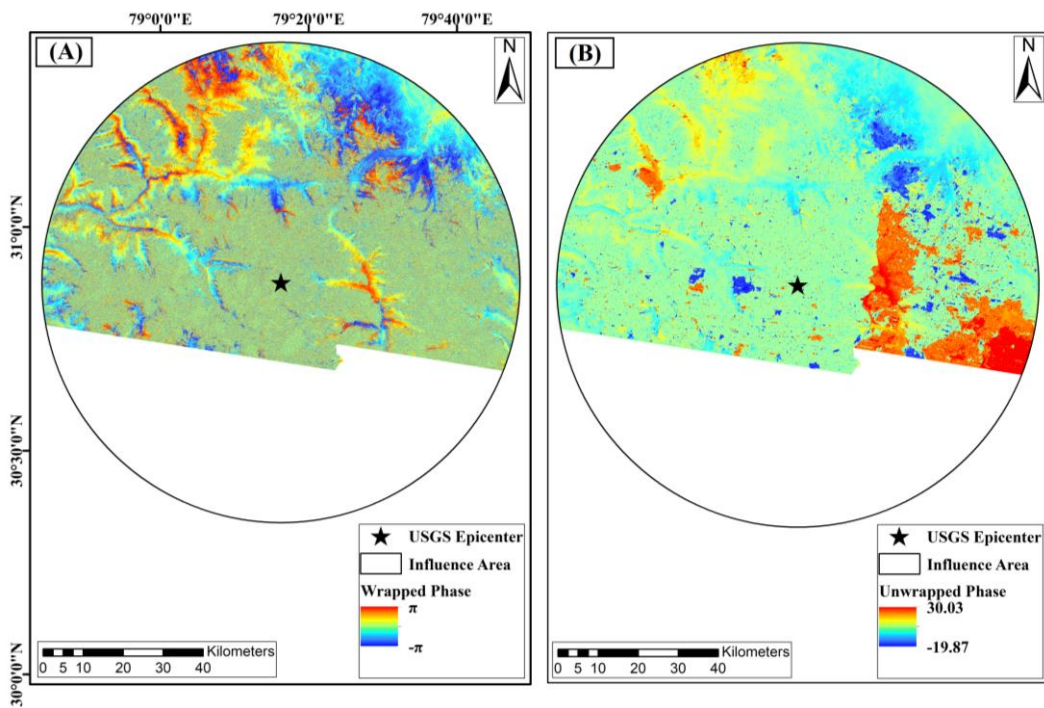


Figure S13: Beach ball representation for the focal mechanism solutions of the 2017 Thang Earthquake (M_w 5.2)



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Figure S14: Map showing (A) wrapped phase and (B) unwrapped phase within the influence area for 2021 Joshimath earthquake (Mw 4.5).

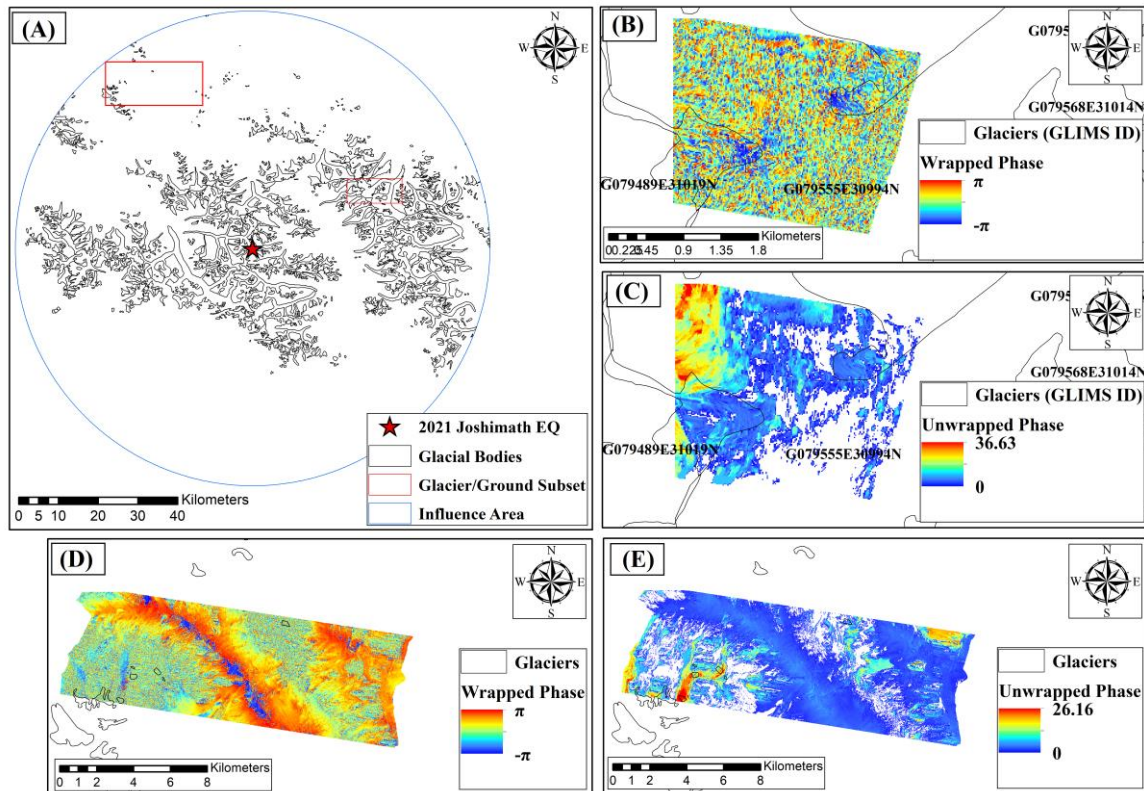


Figure S15: Map showing (A) ground and glacial subset regions, (B) wrapped phase within glacial subset, (C) unwrapped phase within glacial subset, (D) wrapped phase within ground subset and (E) unwrapped phase within ground subset for 2021 Joshimath earthquake (Mw 4.5).

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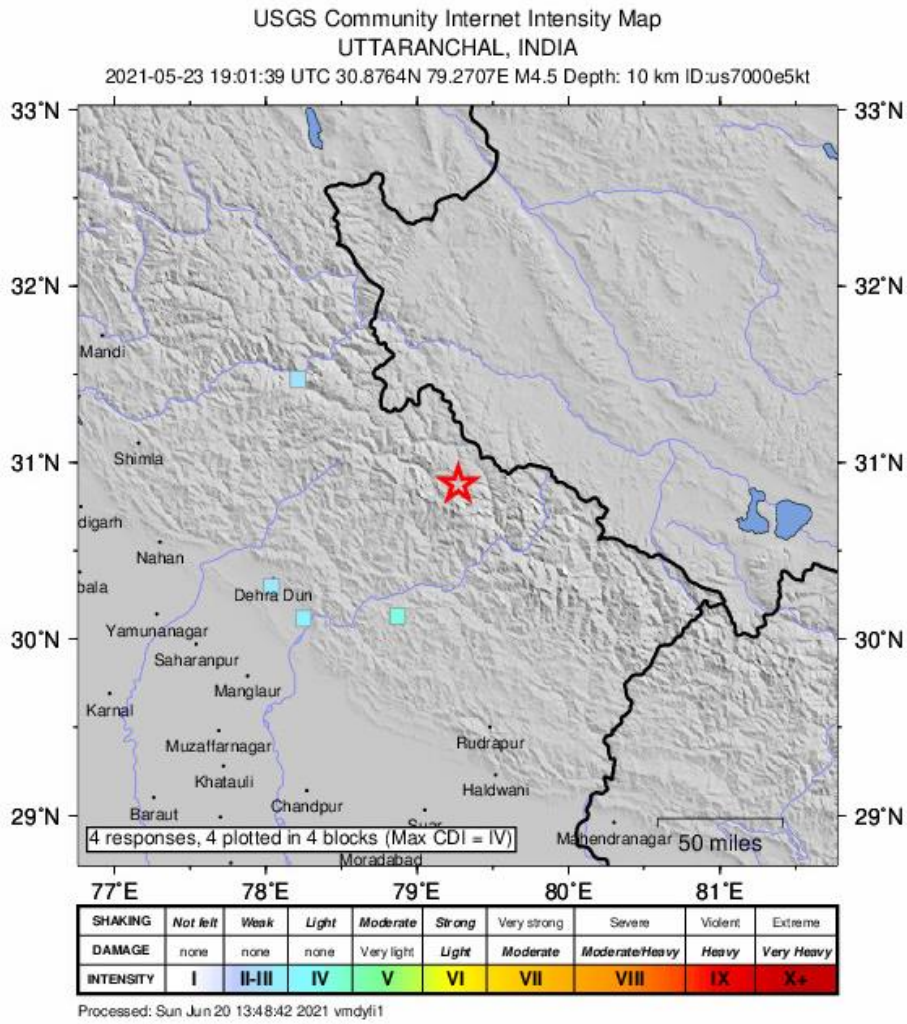


Figure S16: USGS Shake Map for 2021 Joshimath earthquake (Mw 4.5).

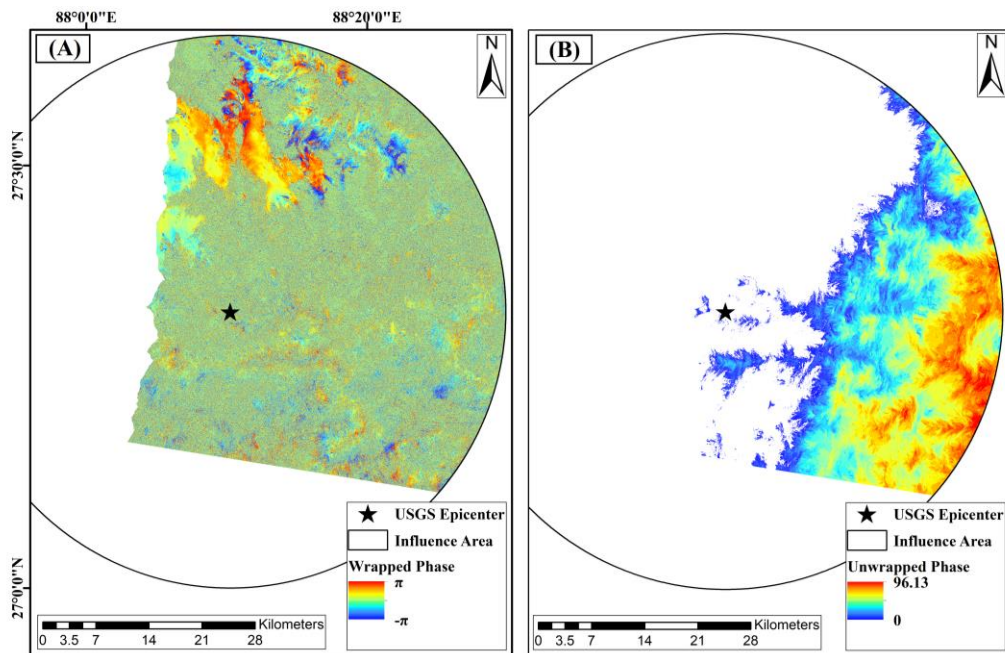


Figure S17: Map showing (A) wrapped phase and (B) unwrapped phase within the influence area for 2017 Sikkim earthquake (Mw 4.2).

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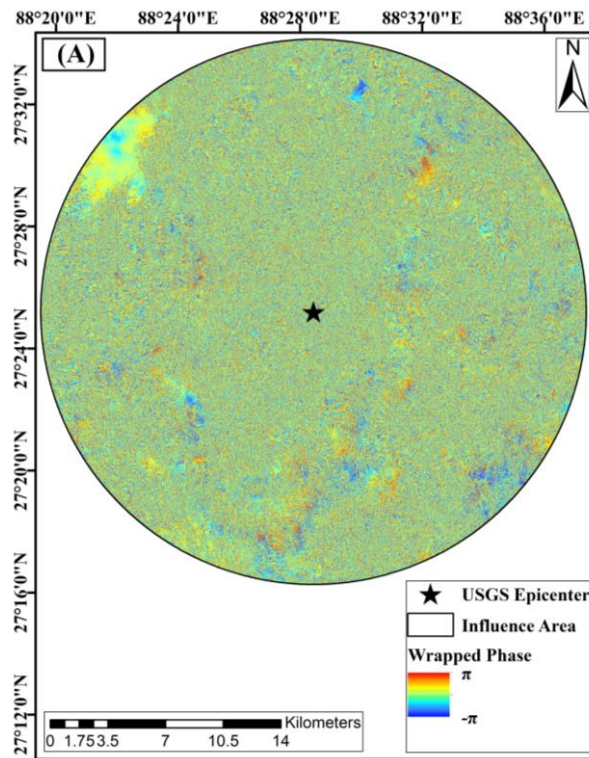


Figure S18: Map showing wrapped phase (no information captured in unwrapping) within the influence area for 2018 Sikkim earthquake (Mw 4.4).

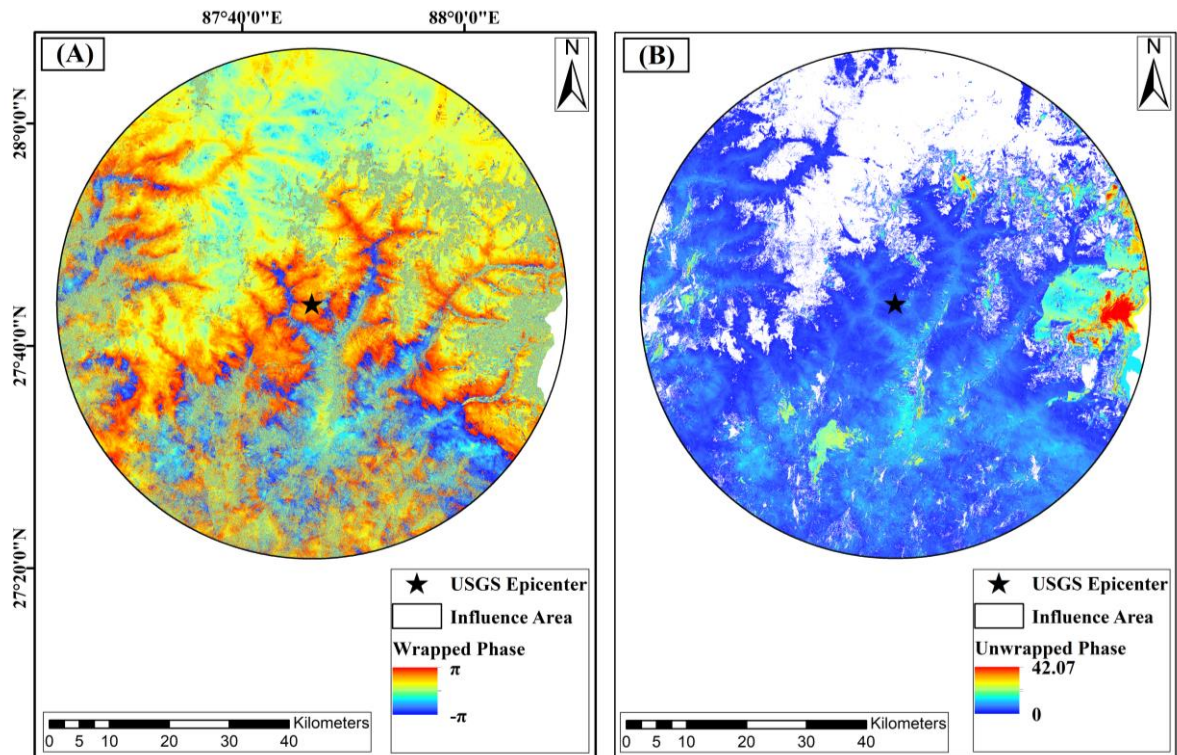


Figure S19: Map showing (A) wrapped phase and (B) unwrapped phase within the influence area for 2020 Nepal earthquake (Mw 4.1).

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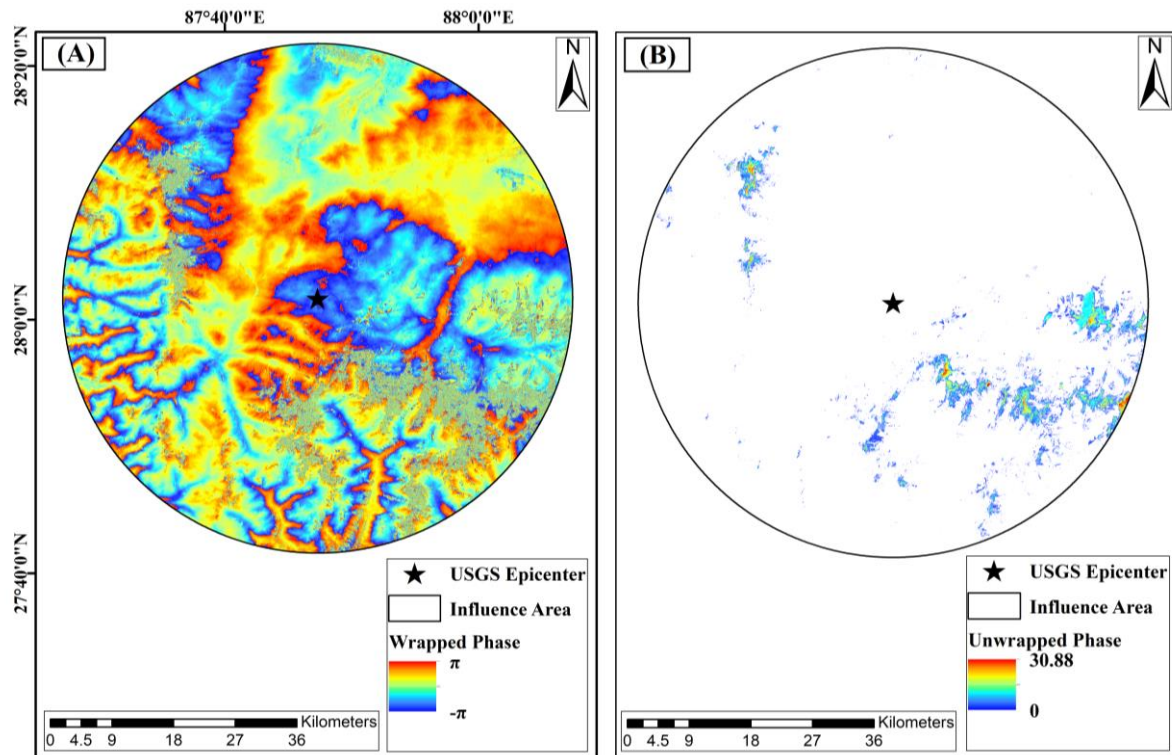


Figure S20: Map showing (A) wrapped phase and (B) unwrapped phase within the influence area for 2021 Nepal earthquake (Mw 4.1).